Supporting Information

F^- Substitution-Induced High-Efficiency Broadband Near-Infrared MgAl$_2$O$_4$:Fe^{3+} Phosphors for Night-Vision and Biomedical Imaging

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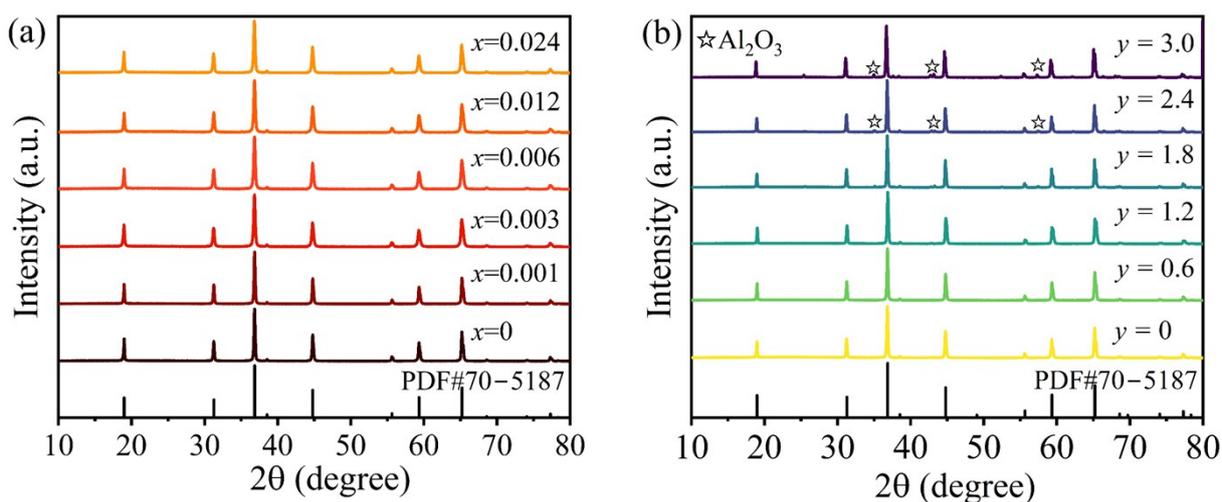*E-mail: jwen@aqnu.edu.cn*

Figure S1. XRD patterns of a) MgAl$_{2-x}$O$_4$:xFe^{3+} ($0 \leq x \leq 0.024$) and b) MgAl$_{1.994}$O$_{4-y}$F$_y$:0.006Fe^{3+} ($0 \leq y \leq 3.0$).
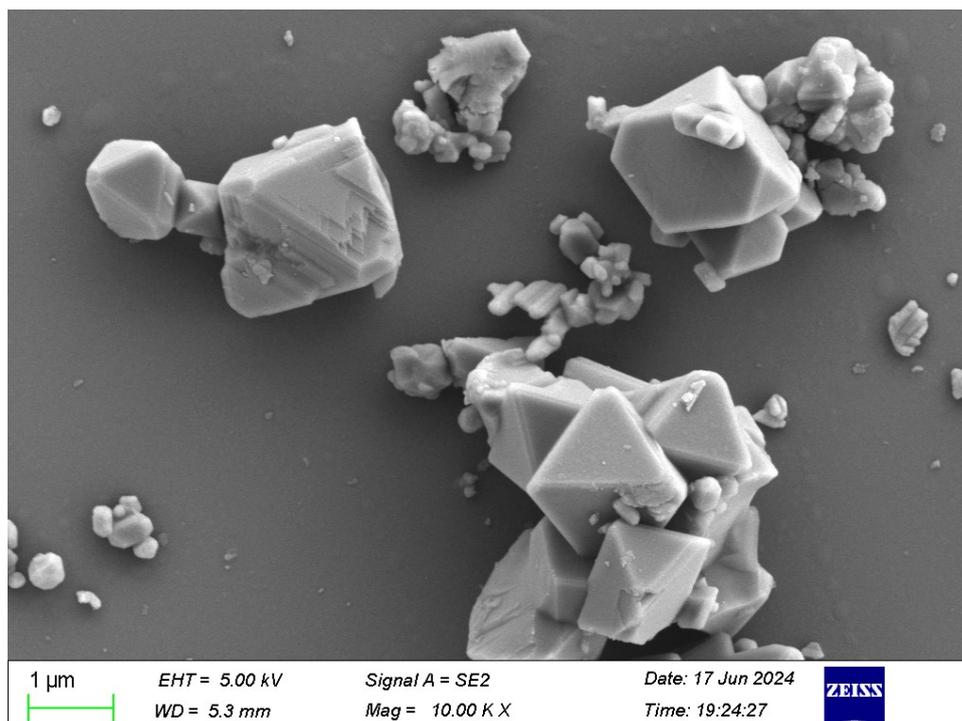
Figure S2. SEM image of $MgAl_{1.994}O_{2.8}F_{1.2}$:0.006$Fe^{3+}$.

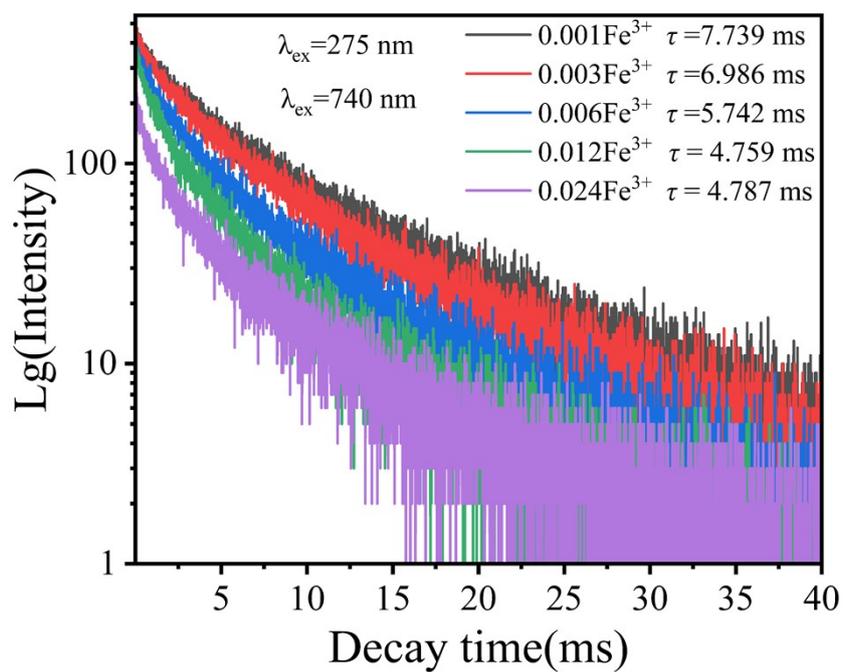**Figure S3.** Luminescence decay curve of $MgAl_{2-x}O_4$:$x$$Fe^{3+}$ excited by 275 nm and monitoring at 740 nm.

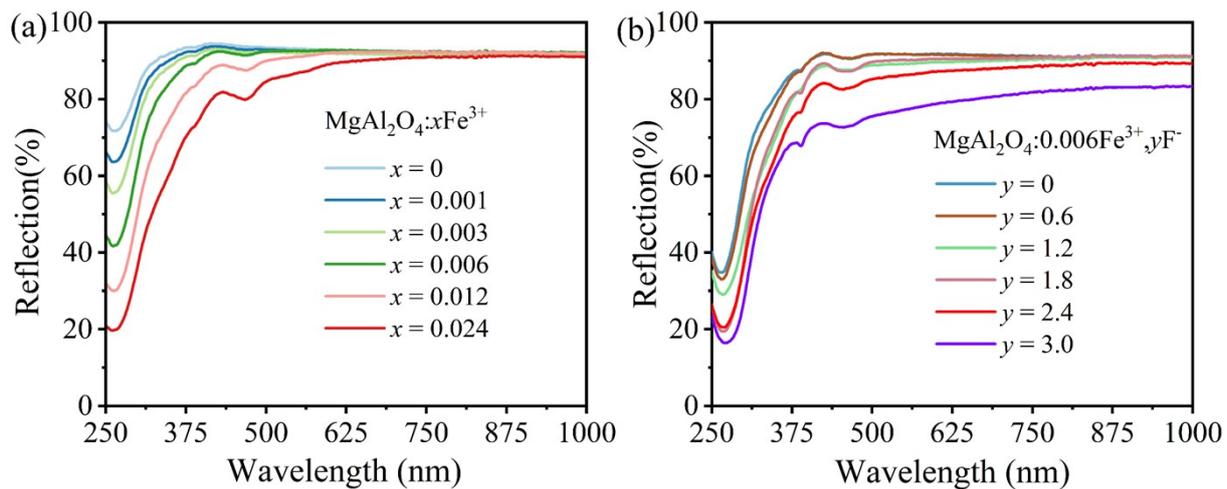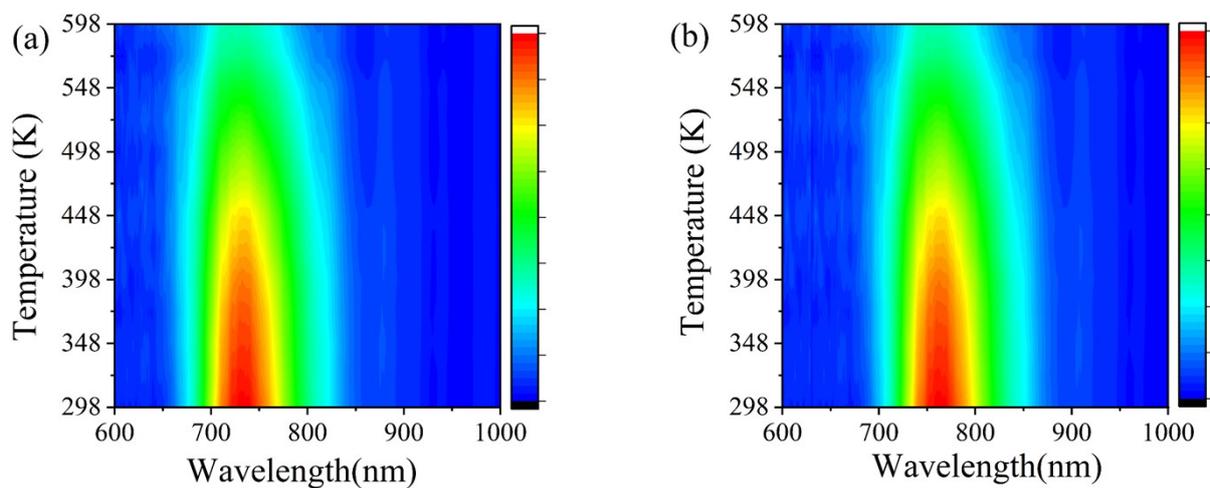**Figure S4.** DRS patterns of a) $MgAl_{2-x}O_4$:xFe^{3+} ($0 \leq x \leq 0.024$) and b) $MgAl_{1.994}O_{4-y}F_y$:$0.006Fe^{3+}$ ($0 \leq y \leq 3.0$).

Figure S5. Temperature-dependent emission spectra of $MgAl_{1.994}O_4$:$0.006Fe^{3+}$ ($\lambda_{ex} = 275$ nm) and $MgAl_{1.994}O_{2.8}F_{1.2}$:$0.006Fe^{3+}$ ($\lambda_{ex} = 310$ nm).